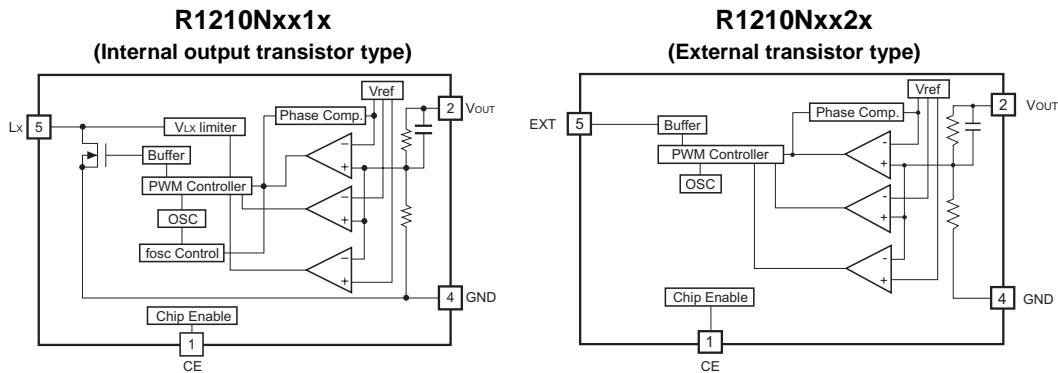


The R1210N Series are low supply current, CMOS-based PWM step-up DC/DC converters. By simply using an inductor, a diode, and a capacitor as external components, a high-efficiency step-up DC/DC converter can be easily configured. The xx1 version with an internal output transistor and the xx2 version with an external transistor are available. The oscillator frequency can be selected from 100kHz or 180kHz. The xx1A version is also available, which contains a basic frequency changeover circuit that switches the oscillator frequency from 100kHz to 35kHz when output load is reduced. R1210N also has a function that detects drastic changes in output voltage and reduces the amount of overshoot/undershoot by switching control mode.

### FEATURES

- Supply Current ( $I_{DD1}$ ) ..... Typ. 35 $\mu$ A (R1210N301, 100kHz), Typ. 60 $\mu$ A (R1210N301, 180kHz) ( $V_{IN}=SET\ V_{OUT} \times 0.96$ ) Typ. 20 $\mu$ A (R1210N302, 100kHz), Typ. 25 $\mu$ A (R1210N302, 180kHz)
- Supply Current ( $I_{DD2}$ ) ..... Typ. 10 $\mu$ A ( $V_{OUT}=SET\ V_{OUT}+0.5V$ , 100kHz) Typ. 15 $\mu$ A (Same as the above, 180kHz)
- Standby Current ( $I_{standby}$ ) ..... Max. 0.5 $\mu$ A (In standby)
- Input Voltage Range ( $V_{IN}$ ) ..... Max. 8.0V
- Start-up Voltage ( $V_{start}$ ) ..... Max. 0.9V (xx1 Version), 0.8V(xx2 Version)
- Output Voltage Range ( $V_{OUT}$ ) ..... 2.2V to 6.0V (internally fixed) (2.2V to 3.5V for xx1A)
- Output Voltage Accuracy .....  $\pm 2.5\%$
- Oscillator Frequency ( $f_{osc}$ ) ..... 100kHz (xx1A/xx1C/xx2C Version), 180kHz (xx1D/xx2D Version)
- Basic Frequency Change-over Circuit ..... 100kHz  $\rightarrow$  35kHz (only xx1A Version)
- Oscillator Maximum Duty Cycle (Maxduty) ..... Typ. 85%
- Efficiency ..... Typ. 88% (R1210N301,  $V_{IN}=1.8V$ ,  $I_{OUT}=10mA$ )
- Package ..... SOT-23-5

### BLOCK DIAGRAMS



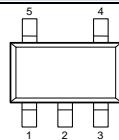
### SELECTION GUIDE

Halogen Free	Package	Q'ty per Reel	Part No.
H/F	SOT-23-5	3,000 pcs	R1210Nxx*\$-TR-FE

- xx : Specify the output voltage within the range of 2.2V (22) to 6.0V (60) in 0.1V steps.  
(up to 3.5V (35) for xx1A)
- \* : Select from (1) internal output transistor type or (2) external transistor type.
- \$ : Select from (A) oscillator frequency 100kHz, built-in basic frequency change-over circuit, (C) 100kHz or (D) 180kHz.  
(R1210Nxx2A-TR-F is not available.)

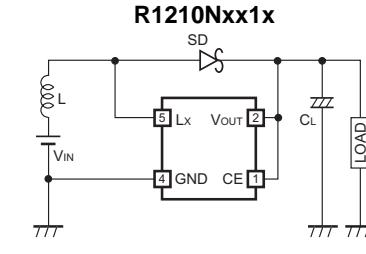
### PACKAGE (Top View)

SOT-23-5

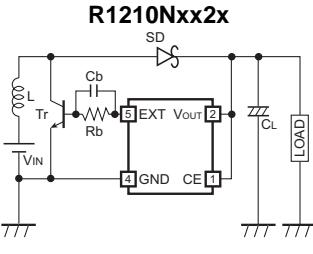


1	CE
2	Vout
3	NC
4	GND
5	Lx or EXT

### TYPICAL APPLICATIONS



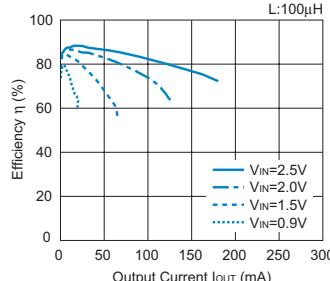
L : 100 $\mu$ H, SD : MA721, CL : 22 $\mu$ F $\times$ 2



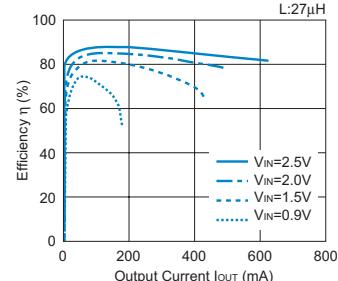
L : 27 $\mu$ H, SD : RB491D, Tr : 2SD1628G, CL : 47 $\mu$ F $\times$ 2, Rb : 300 $\Omega$ , Cb : 0.01 $\mu$ F

### TYPICAL CHARACTERISTICS

**R1210N301C**  
Efficiency vs. Output Current



**R1210N302C**  
Efficiency vs. Output Current



### APPLICATIONS

- Power source for battery-powered equipment
- Power source for hand-held communication equipment, cameras, and VCRs
- Power source for equipment that requires the voltage greater than the battery voltage



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## RICOH COMPANY., LTD. Electronic Devices Company



■Ricoh presented with the Japan Management Quality Award for 1999.  
Ricoh continually strives to promote customer satisfaction, and shares the achievements of its management quality improvement program with people and society.



■Ricoh awarded ISO 14001 certification.  
The Ricoh Group was awarded ISO 14001 certification, which is an international standard for environmental management systems, at both its domestic and overseas production facilities. Our current aim is to obtain ISO 14001 certification for all of our business offices.

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Ricoh completed the organization of the Lead-free production for all of our products. After Apr. 1, 2006, we will ship out the lead free products only. Thus, all products that will be shipped from now on comply with RoHS Directive.